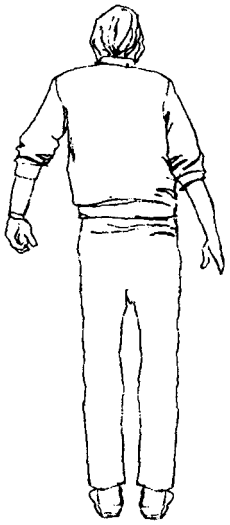
Projectile Practice

1. In the diagram below, a stationary observer on the ground watches as a seagull flying horizontally to the right drops a clamshell.



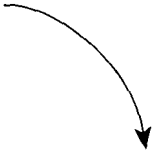
Which diagram best represents the path of the falling clamshell as seen by the observer?
[Neglect air resistance.]

1)

3)

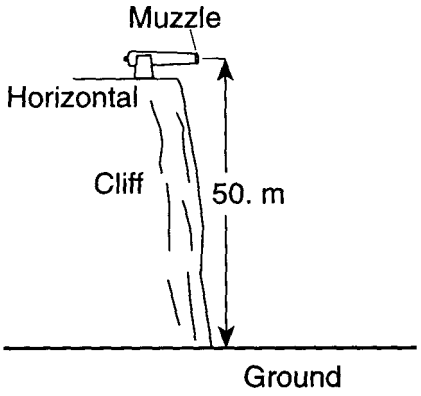
2)

4)



2. A baseball player throws a ball horizontally. Which statement best describes the ball's motion after it is thrown? [Neglect the effect of friction.]
   1) Its vertical speed remains the same, and its horizontal speed increases.
   2) Its vertical speed remains the same, and its horizontal speed remains the same.
   3) Its vertical speed increases, and its horizontal speed increases.
   4) Its vertical speed increases, and its horizontal speed remains the same.

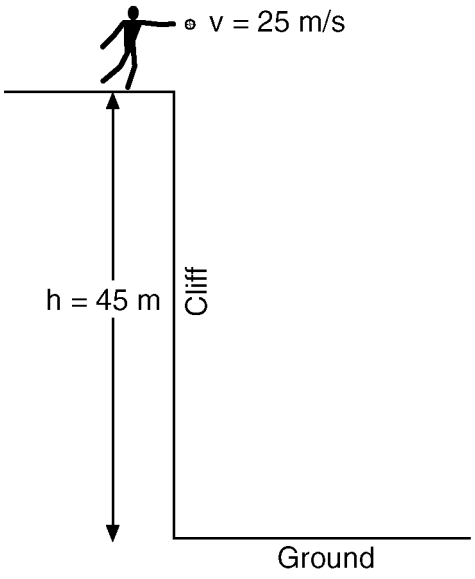
3. The diagram below shows the muzzle of a cannon located 50. meters above the ground. When the cannon is fired, a ball leaves the muzzle with an initial horizontal speed of 250. meters per second. [Neglect air resistance.]



Which action would most likely increase the time of flight of a ball fired by the cannon?
   1) pointing the muzzle of the cannon toward the ground
   2) moving the cannon closer to the edge of the cliff
   3) positioning the cannon higher above the ground
   4) giving the ball a greater initial horizontal velocity

Projectile Practice

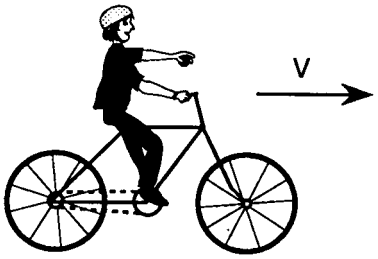
4. The diagram below shows a student throwing a baseball horizontally at 25 meters per second from a cliff 45 meters above the level ground.



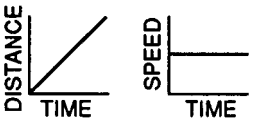
Approximately how far from the base of the cliff does the ball hit the ground? [Neglect air resistance.]

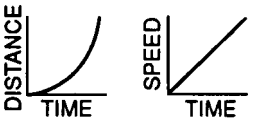
1) 45 m
2) 75 m
3) 140 m
4) 230 m

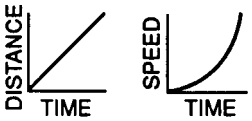
5. The diagram to the right represents a bicycle and rider traveling to the right at a constant speed. A ball is dropped from the hand of the cyclist.

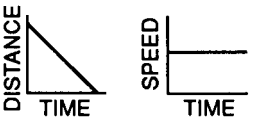


Which set of graphs best represents the horizontal motion of the ball relative to the ground? [Neglect air resistance.]

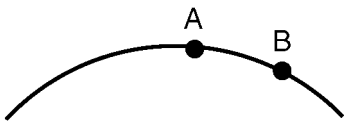
1)


2)


3)


4)


6. The diagram below represents the path of an object after it was thrown.

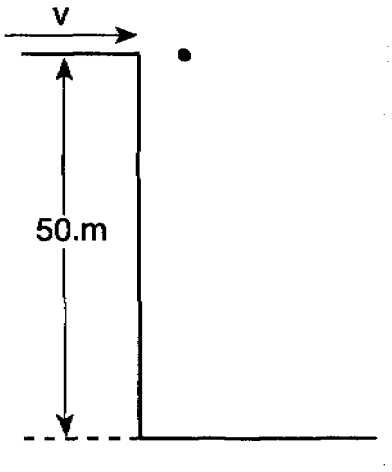


What happens to the object's acceleration as it travels from *A* to *B*? [Neglect friction.]

1) It decreases.
2) It increases.
3) It remains the same.

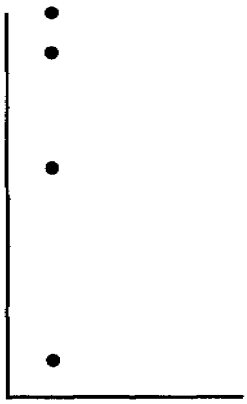
Projectile Practice

7. A ball is projected horizontally to the right from a height of 50. meters, as shown in the diagram below.

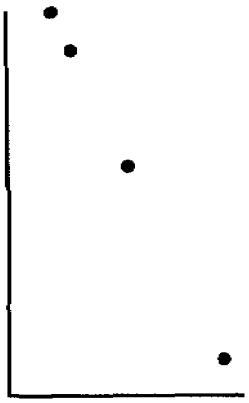


Which diagram best represents the position of the ball at 1.0-second intervals? [Neglect air resistance.]

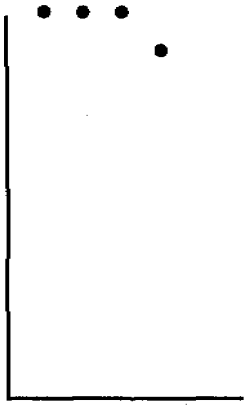
1)



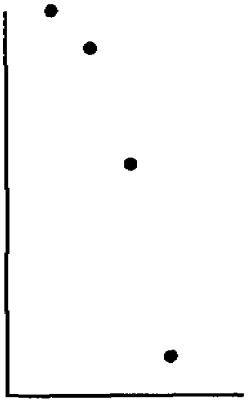
3)



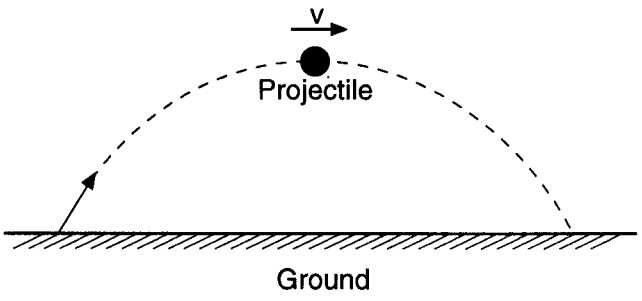
2)



4)



8. The diagram below shows a projectile moving with speed v at the top of its trajectory.



Which vector best represents the acceleration of the projectile in the position shown?

1)

3)

2)

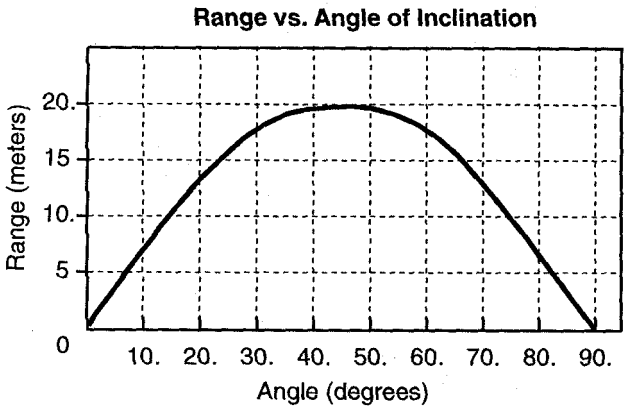
4)

9. The path of a projectile fired at a 30° angle to the horizontal is best described as
   1) parabolic
   2) linear
   3) circular
   4) hyperbolic

10. A vector makes an angle, θ, with the horizontal. The horizontal and vertical components of the vector will be equal in magnitude if angle θ is
   1) 30°
   2) 45°
   3) 60°
   4) 90°

Projectile Practice

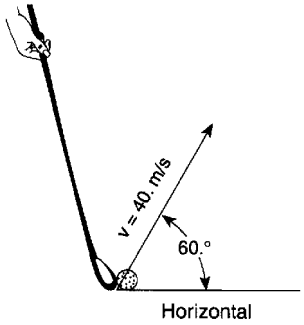
11. Projectiles are fired from different angles with the same initial speed of 14 meters per second. The graph below shows the range of the projectiles as a function of the original angle of inclination to the ground, neglecting air resistance.



The graph shows that the range of the projectiles is

1) the same for all angles
2) the same for angles of 20.º and 80.º
3) greatest for an angle of 45º
4) greatest for an angle of 90.º

12. The diagram below shows a golf ball being struck by a club. The ball leaves the club with a speed of 40. meters per second at an angle of 60.° with the horizontal.



If the ball strikes the ground 7.1 seconds later, how far from the golfer does the ball land? [Assume level ground and neglect air resistance.]

1) 35 m
2) 71 m
3) 140 m
4) 280 m

Projectile Practice
Answer Key
[New Exam]

1. 4
2. 4
3. 3
4. 2
5. 1
6. 3
7. 4
8. 4
9. 1
10. 2
11. 3
12. 3